The RARS EXCITER

Issue 253 - April, 1991 - Club Repeaters: 146.04/64 , 223.04/224.64 , & 444.5/449.5

RARS Birthday Party a Resounding Success

In lieu of the "regular" monthly meeting, a celebration was held to commemorate the 21st birthday of RARS. The event was in the form of a pizza party, which was attended by 175 (official count) members & their guests and families. Thanks to the efforts of Anita, KC4AQB, and her most willing helpers, the meeting room at the Y was provided with a real party atmosphere: table cloths, candles, flowers, & balloons graced each table. A large "Happy Birthday RARS" banner was behind the podium, and several cakes were proudly displayed on a table, including a gorgeous (and huge) birthday cake bearing the RARS logo! [Ed. Note: We insiders know that 'Nita baked all weekend before the party — she spent over 4 hours hand decorating that one big cake, & even took a vacation day from work to decorate the room. Talk about dedication! 'Nita and **all her helpers** did a fantastic job!]

There was also salad (16 heads of lettuce, 2 lbs of carrots, 3 lbs of cheese, cucumbers, onions, etc. etc. topped with 12 large bottles of dressing) and the usual soft drinks / coffee / tea. The food was great! The only real "hitch" was in the supply of pizza ... we planned on 130 people — 175 showed up. Hence our initial order was a little small, and the folks supplying the pizzas didn't live up to their commitment to respond within 15 minutes for a "follow up" order. The result was that 30 or so people had to wait a little longer, but nobody went away hungry. The final count: 45 LARGE pizzas.

Adult entertainment was provided by "Raisin' Cain," a ladies Barbershop Quartet, which included the XYL of our own NA4G. The kids (and there were a lot present!!) were kept busy with a clown making balloon animals in a different room. Quite a party.

The month of March is also set aside for recognizing those individuals who have made extraordinary contributions to the club. President Jim DuBreck awarded plaques to:

Jim Babcock - K4ABJ - For the impressive continuous service as Net Manager of the W4DW 2-Meter net. During the past 10 years, Jim provided instruction, guidance and, when asked, callsign lookup service for our HF contact hunters.

Alan Pitegoff - AB4OZ - For outstanding service in the support of the 04/64 machine. For the cold days and late nights. For the tower climbing (all 425 Feet of it). For the antenna installation activity, preparing the site, preparing the antenna, etc. In addition, Alan took an idea espoused by N4UOF and continues to make a success of it. Yep, the RARS Tech Net on Saturday night is becoming the talk of Central North Carolina. People now check in to the net just to get assistance in the repair of their equipment. Alan continues to be a significant contributor to on the air troubleshooting. **Continued on page 3**

HAMFEST!!!
Sunday April 14th!!

The Raleigh Amateur Radio Society, Inc. (RARS), founded in 1969, has grown to be one of the premier radio clubs in North Carolina. Current membership exceeds 300.

The objectives of the club are to promote world wide friendship through Amateur Radio; to be of public service by providing radio communication in times of disaster, emergency, or civic need; to educate members in radio technique, and to assist in obtaining Amateur Radio licenses.

All persons interested in Amateur Radio, currently licensed or not, are eligible to apply for membership to the club.

Dues to the club are $10.00 per year (which runs from July 1 to June 30). Applications for membership may be obtained from any of the officers named below; from the newsletter editor, named on the facing column; or at any RARS Meeting.

Club meetings are held the first Wednesday of every month, 7:30 PM, at the Raleigh YMCA, 1601 Hillsborough St.

In addition to the many social and special events, the club sponsors a 2 m repeater, W4DW, on 146.04/64 MHz; on 223.04 / 224.64 MHz, & 444.5 / 449.5 using the call WA4PEN. All repeaters cover Raleigh, and most of the surrounding Wake County area. Autopatch privileges are available on W4DW to duly licensed RARS members. Future plans call for additional repeaters on the 50 MHz amateur band.

1991 Officers:

President:	Jim DuBreck, N4BYO 1209 Shelly Road Raleigh, NC 27609 781-9437
Vice President:	Anita Kellum, KC4AQB 208 Chatterson Drive Raleigh, NC 27615 846-7455
Secretary:	Ronny Reams, WA4MJF 3509 Rolesville Road Wendell, NC 27591 266-4434
Treasurer:	Tim Buehlmann, N4IQA 1314 Chaney Rd. Raleigh, NC 27606 851-7738

The EXCITER is published monthly by the Raleigh Amateur Radio Society, and is mailed at no cost to its members.

Letters to the Editor, technical articles, items of interest to the ham community and guest editorials are actively solicited.

Any article published in the EXCITER does not necessarily represent the views of, the Officers, Board of Directors, Editor, or Society Membership, nor does publication thereof represent concurrence by the Officers, Board of Directors, Editor, or Society membership with the contents of the article.

Articles will be printed at the discretion of the Editor, and no article will be published unless it is accompanied by the name(s) of the person(s) submitting the article.

All copy must be in the hands of the editor by the end of the Board of Director's meeting on the third Wednesday of each month. Articles submitted for publication may be hand or type written, an ASCII file on disk (IBM or APPLE format), transmitted electronically via telephone modem, or on the ham bands using RTTY or PACKET.

Ham related items for sale by the members will be advertised without charge for one issue, but may be re-submitted as often as desired. These ads must be non-commercial in nature.

Commercial ads will be run in return for the following donations to the club:

	Single Issue	Full Year
Business Card	$5.00	$25.00
Quarter Page	$10.00	$50.00
Half Page	$20.00	$100.00
Full Page	$30.00	$150.00

(Commercial ads must be of "camera-ready quality," and obviously can not be sent via ham bands.) Due to the reprographic process used, no color copy can be accepted.

Advertisers are guaranteed a minimum monthly mailing of 400 copies.

Editor:	Vince Yakamavich, AA4MY 220 Carriage Trail Raleigh, NC 27614 847-8512 (Home) 850-5390 (Office)

SPECIAL SERVICE CLUB

ARRL

Young Ladies' Radio League

AMSAT

SOUTHEASTERN REPEATER ASSOCIATION SOLAR MEMBER

Party

Continued from Page 1

Jerry Stuckle AI0K - For Outstanding service in support of the Sky Warn Net.

Certificates were awarded to:

Fran Beckett - N4SDQ - For Exceptional Service: In support of the RARS BBS. Without her presence, the BBS would not exist.

Walter Van Gieson - AB4DQ - For Exceptional Service as the RARS Special Events Coordinator

James Martin - KA5IEC - For Exceptional Service: In organizing and managing the RARS BBS.

John Thomas - KK4JB - For Exceptional Service: Vice President and Outgoing QSL Manager.

Lynn Pitegoff - KC4NJB - For Exceptional Service: Operation Santa Claus, and for organizing and sustaining the Ham Helpers program.

Sherry Reams - KB4EXL - For Exceptional Service: Establishment of and sustaining the Woman's Information Net.

Dave Williams - AB4LR - For Hamfest support: Hamfest Chairperson 2-years.

Lynn Pitegoff - KC4NJB - For Exceptional Service: To the visually impaired hams in the community via the transcription of the EXCITER on a monthly basis.

Johnny Mayfield - WA4SZL - For Exceptional Service: RARS homebrew activities.

Gary Pearce - KN4AQ - For Exceptional A[A Service: Publicity. TV at Field (all three major stations), TV for hams in the Middle East Crisis, Editing and making copies of tapes available to all RARS members (free !).

Edward Breeden - N4SSU - For Exceptional Service: Public Service Chair. Persistent in gathering hams together to help the community.

Noble Phelps-Breeden - N4UOQ - For Exceptional Service: SkyWarn net operation.

Bert Baily - W4FMN - For Exceptional Service: Exciter in the authoring the "Bert's Beat" column for years and years, with consistency and quality.

Matt Reynolds - KB2ACE - For Exceptional Service: Homebrew SIG support and promotion, especially through the RARS class and direct assistance to fellow members.

Sherman Starnes - W4TZU - For Exceptional Service: AMSAT Coordinator and years of Exciter contributions: "The Leading Edge."

Veep Anita took the stage, and made the following presentations: "In recognition for special efforts put-forth by Ladies of this club who have activly helped and served in all aspects of social events for the past 10 years, we extend this token of appreciation (a red carnation) . These ladies have always been there to help in anyway they could, — everytime, — every occasion.

Will these ladies please stand and be escorted by their best friend to the stage.

Nola Alderman - escorted by Ed, WA4PEN
Audrey Brown - (not present)
Althea Corns - Escorted by Bob, K4MC
Pat Eggers - Escorted by Bruce, WA9NEW
Mary Jo Littlewood - (left early)
Sue Parks, WB4USX - Escorted by Brent (?)
Doris Plaks - Escorted by Norm, KN4G
Marty Silver, NY4H - Escorted by her husband
Ann Bradley, WA4APK - (not present)"

Closing out the awards, AA4MY recognized 21 VEs, for their exemplary service over the past year.

Before breaking up, the crowd sang a verse of "Happy Birthday" to RARS' Statesman, **Bruce Eggers, WA9NEW,** whose birthday was in the same week. Still recovering from his stroke and not yet able to voice his appreciation, Bruce was obviously pleased that the crowd remembered him. There was also a special bday cake for him too, courtesy of KB4EXL.

All in all — it was quite a "meeting," enjoyed by all. What's that?? You weren't there?? Shame on you. Your missed a GREAT meeting!

AA4MY

Another RARS Couple to Wed??

Rumor has it that Liz Gordon, KC4UCI has sed "yes" to the question posed by Joe White, WA4GIR. (No wonder Joe has been smiling a lot lately!) RARS' first couple was N4UOQ & N4SSU. 'Come on guys, we're a **radio club**, not a matrimonial agency!!

Welcome New Members!!

Let's extend a warm RARS Welcome to 21 (!) new members this month (the *) after the name signifies that these folks are from the RARS Novice / Tech Class):

Dusty Woodlief, N4IQI, Raleigh
Ed Conen, Raleigh, (Tech class, but call??)
Thomas S. Davies, Apex (no call, yet)
Rev. Clyde Starling Jr. (no call, yet)
Mary Long, WA4IAW, Raleigh
Brock M. Nicholson*, Raleigh
John Yarboro*, Raleigh
Cullin Hall*, Raleigh
Jerry Imhoff*, Raleigh
Dennis J. Osborne, Raleigh
Robert J. Martel*, Durham
Victoria P. Eaton*, Youngsville
Joseph Eaton*, Youngsville
Veleta M. Harris*, Cary
C.R. "Bob" Grady*, Raleigh
Harold A. Ramsey*, Cary
Cameron Michael*, Carrboro
Ron Michael*, Carrboro
Greg Young*, Apex
Cyndi Wood*, Raleigh
Bill McAdams*, Raleigh
Dick Rohlf*, Durham

As always, we wish you welcome into our most "humble" organization. We hope that you will choose to become active in the many happenings within RARS. Certainly, the more active you become, the more enjoyment you will receive. We encourage all new comers to join in on the RARS nightly net, 8:00 PM, on the 146.04/64 repeater (after your license comes, of course!)

With the addition of these fine folks, the roster stands at 389!

Again, WELCOME to RARS !!

Public Service Watch

April 7 is fast approaching. This is the date of our first Public Service event. It is the Multiple Sclerosis walk. They have requested 14 volunteers to help with communications for their event. We will meet at JC Pennys, Cameron Village at 11 AM (walk starts at 12:30) and we will be needed until about 5:00 at which the course will be swept for anyone left walking. Volunteers will be needed to provide communications at several checkpoints, aboard sag-wagons traversing the 9 mile course, and to "shadow" several event officials. We will try to use a simplex 2 meter frequency for the event, but if we are unable to maintain communications there, we will use the 04/64 repeater. Each volunteer will receive a T-shirt, a box lunch, and a certificate. Please contact me if you can help at 677-1891 (H) or 850-5337 (W).

Our next event is one that RARS has supported for a number of years, it is: April 20 - March of Dimes Walkamerica. It starts and ends at the Governers Inn in RTP. This is the one of RARS regular activities. About 14 volunteers will again be needed.

These events are a good oportunity for RARS to get some public exposure and use our 2M rigs that we have spent hard earned money for.

73,
Bill, KC4UQO

Meeting Topic:

In addition to discussing & votng on the proposed by-laws changes, the guest speaker for the April meeting will be Dennis Decker of the National Weather Service. The program will be "Severe Weather Spotters Program for SkyWarn Severe Weather Net." This is Official "Severe Weather Spotter" training , and is a requirement for SkyWarn Net Control Stations. So if you're considering being a SkyWarn NCS, you will NEED to attend this training session!). Dennis will present some slides & videos of severe weather. This will be a very interesting meeting for all! Hope to see you there.

Anita Kellum, KC4AQB

RARS Crystals Activities

The March meeting of the RARS YL group, the Crystals, was held on Thursday, March 21st. Attendance was a little less than usual, probably because the meeting night had been moved up one week, so that we would attend the RARS Class during their "Tune in the World" night.

Prior to the class, the YLs enjoyed a steak dinner, and discussed their upcoming activities: at the Hamfest Social (the Saturday night before the 'fest), the YLs will be quite busy. Although some of the food for the social will be bought, a large portion will be "pot luck," and come from our members. Also, the day of the 'fest, the Crystals will be manning — er — working the RARS Club table. OMs — make sure to watch for them in their distinctive shirts at the hamfest!

Plans for Field Day include a YL (only) station!! [Ed: Darn! That sounds like a fun place to be!] OM's are warned to keep their eyes on the rigs, lest they "disappear" that weekend! Fran Beckett, N4SDQ, has accepted the role of "Station Master," and will be coordinating that activity.

The door-prize of the meeting (an African Violet) was won by Alice Rozenbroek, N4ZBA (who drove in from Chapel Hill to enjoy the Crystal's outing).

Following the dinner, the YLs moved to the McKimmon Center, where they had the opportunity to meet with several of the YLs attending the class, and perhaps stimulate their interest to take a more active role in the hobby.

The next meeting of the RARS Crystals will be in the month of May, and more details about this meeting will appear in the next issue of the EXCITER.

33,

Lynn Pitegoff, KC4NJB

Swan Island DX Association

Monthly Pizza and Suds

A regular get-together was held at the White Swan restaurant March 20th and 14 people showed up to share stories, ideas, building projects and pizza with suds.

Notable comments were made by K8SL and NO0T regarding the DXpedition to Bangledesh by Jim Smith VK9NS - apparently it is on again and should be heard shortly (keep your eyes out for this one on the Cluster). (NF4P reports that Jim has preshipped a rig/amp and antenna to site, still to get call sign).

Other comments - how NO0T blew a perfect chance of working HS0AC on 40 meters by transmitting on 15 meters instead with his TS-930 in split mode, and how K4NYV discovered his squelch control on his TS-950. (Sometimes technology can come back and bite you). Guests attending were: Sunil from Sri Lanka (soon to be a ham) - a friend of Nelson, 4S7NE.

Jim AB4TD has a newly raised 4 ele Cushcraft beam up on his tower ready for building his DXCC award. Marty NY4H and her OM Mike discovered the White Swan and the pizza bar. Al W4VP showed all his newly built state-of-the-art keyer that takes commands in morse (neat idea).

Hand outs: - copy of article from W6GO on packetclusters and copy of "The Pileup" - produced by KD4IL of the Carolina DX Association.

These Pizza ands Suds events are held every third Wednesday of the Month inthe back of the White Swan in Oak Park Plaza (beside Oak Park Pharmacy). See you next month??

73 Paul NO0T

Homebrew SIG Report

Bob Keys NNA4G gave a real good talk on linear amplifiers at the March meeting. He also presented an excellent write up on them. I can recommend this paper highly. For anyone who is interested and could not make the meeting, they can get a copy by calling Bill Ransier, N1BA, @ 846-2692.

The next meeting will be on "ALL YOU WANT TO KNOW ABOUT THE WORKINGS OF RECEIVERS" by Tom McKee K4ZAD. It will be the second Wed in April, April 10 at 7:30 PM. Location: Residence of Jim Smith, AB4TD. 11017 Mason Ridge Road, North Raleigh. Phone 846-0525. Talk in on 04-64.

73, Bill, N1BA

Wake County ARES

Tom Klimala, KM4LB
Wake County EC

This column will appear monthly. There. I said it. In front of 400+ people. It had to be said publicly lest I be tempted to backslide and skip a month here and there. This column will feature "all the news that's fit to print" about local efforts in the emergency service arena. (I am currently soliciting suggestions for a title for this column.)

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The new ARES call-up rosters have been mailed. If you did not receive one at the birthday party or through the mail, send a SASE to WAKE COUNTY ARES, 1545 Seabrook Ave, Cary, NC 27511, or pick one up at the next meeting.

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FLASH!!! ESPN COMING TO WAKE COUNTY!

"Aw heck, I get that on cable now." Oh no you don't! We're talking about the Emergency Services Packet Network. What is ESPN? I don't know; I just invented it this week. The major feature will be that it will be a full-time repeater, intended to be used on a daily basis by Wake County hams. These daily users would, in effect, "self-train" themselves and become a pool of indentured operators for use in emergencies. I am currently negotiating with Wake County Emergency Management Office to use the Wake County Court House (18 stories?) as a digipeater site.

The first meeting to discuss/join ESPN will be held during RARSfest at the Wake County ARES table. A sign will be posted, and announcements made as to the time of the meeting. Feel free to call me ahead of time with any ideas or offers you may have.

Interested hams should read/review the article on page 75 of the December, 1990 QST. KM4LB-1 mailbox is available 24 hrs, lightning permitting, on 147.54.

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..."buddy can you spare a dime"

Wake County ARES has no source of income, but we do have some expenses, albeit minor ones. I would like to propose a once-a-year fund raiser to fatten the coffers so that I don't have to travel from club to club to grovel for stamp money. I have reserved a table at RARSfest explicitly for WAKE COUNTY ARES. I propose that Wake county hams donate assorted and sundry junque to this table to be sold for the benefit of WAKE COUNTY ARES. The table would advertise "ALL ITEMS ON THIS TABLE $1.00" We'll accept most anything, in good taste, (ham stuff, books, toys, hand-tools, computer cables etc), that can be sold for a buck. I'm sure the RARSFEST high-up-mucky-mucks might even give us some public address time to promote the venture. This might become a "feature" of RARSfest that people look forward to every year. If you have something you want to donate that might sell for (gasp!) say, five dollars, just mark it "for the benefit of WCA" and leave it at the RARS tables. If you sell it, bring the bux over to our mason jar. We can't count on getting the roster printed and mailed via donations next year, so it's time to think about filling the piggy bank. If anyone wants an accounting of the WCA finances, send a SASE to the attention of the comptroller at the above address.

We still have the $2000 from IBM to purchase a "survivable repeater system". My thoughts right now lean toward a two ICOM dual-banders and attendant hardware. When not used as repeaters they can be used for packet links or to pull signals out of ravines and forests and repeat them to a high-site repeater. Versatile. I have asked Chuck Gleason, KB4MDZ, to run the problem (we all should have such problems!) of how best to spend the money by the UHF/VHF SIG members.

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Mark your calendars for Sunday May 19th. WCA will provide communications support to the Beyond operators, I need help with publicity and some bicycle/motorcycle mobiles to tour the route during the ride. The last ride they put on had 800 entries. This is shaping up as one of the largest cycling events this area has seen. Plan to be a part of it.

73 DE KM4LB <SK>

From our PR Guru

I need some help from RARS members with Publicity and Public Relations. The past year has been a very good one for local Ham Radio media coverage — TV stories on Field Day, Operation Santa Claus, monitoring traffic from Lithuania, MARS traffic from the Persian Gulf, and newspaper coverage on Persian Gulf "evesdropping" and Ham Radio in general.

The area media has a very positive view of Amateur Radio. I contacted them to initiate some of the above stories, and the stations and papers dug some out on their own. We are very visible.

Now I need some additional resources to keep us in a positive spotlight. I'm the RARS Public Affairs Director, but I moved to Raleigh just a year ago, and I don't have all the contacts I need in the Amateur community. For example, a TV station called me when the barge hit the Oregon Inlet bridge in a storm last year. Communication with the island was cut off. They wondered if I could get any information on what was happening. Then when the Gulf War started brewing, I got some more calls — were we in contact with anyone over there?

I couldn't give them the information they wanted. I didn't know who to contact. RARS officers made helpful suggestions, but it took a lot of time to follow up and find people. I sure could use my own instant "data base." So, here's the bottom line:

1. If you find yourself involved in an Amateur Radio related situation that might make for an interesting story, call me! Not sure if it's interesting? Call me and I'll help you decide.

2 Are you in a position to track down activity? For example, do you have an HF station with good, worldwide capability? Do you know the nets, the frequencies, the people? Or do you have a good, wide-area VHF station (FM or SSB)? Could you have tuned in on that Outer Banks emergency? Then list yourself with me, giving the information below.

I can't give any firm rules on getting positive Amateur Radio publicity. News and feature material can be anything. Is there a ham in the area communicating with a Space Shuttle via packet? Great story! Did hams track a tornado across the countryside? A natural! Be aware that local hams tuning into international events or disasters gives the area media a LOCAL connection they are eager to get. The Lithuania story was a good example. An area ham listening to, or especially helping with relief efforts after a hurricane or earthquake anywhere in the world is an angle our local media wants. And it makes us look very good. (How do your neighbors feel about your antenna or tower? N4BYO's neighbors are proud to have a ham in the neighborhood!)

One thing I can say is that TIME is critical. Nothing is deader than yesterday's news. So if you become aware of something that might attract the media, CALL ME QUICK! And if you have the station and/or the contacts to get information when the media calls me, please get the following information to me.

Your NAME, CALL, TELEPHONE, (DAY & EVENING), & ADDRESS. Your capabilities: (I HAVE A GOOD HF / VHF / BOTH STATION).

The scope of your activities? (I can probably help get information in the following emergencies/ activities / situations Area? Regional? National? International??)

Here's how to reach me:

Gary Pearce KN4AQ
***4400 Bleeker Ct., Raleigh, NC 27606**
***233-8306 (leave data on answering machine)**
***833-8888 at Franklin Video.**
(Call me at work only if you have a HOT story needing quick action.)

By-Laws Changes:

In addition to the set of bylaws changes you received in the mail, please be prepared to discuss / vote on the following at the April meeting:

"That effective 01 JUL 91 the RARS annual dues shall be $12.00 per year and a family member shall be $6.00 per year. There shall be a "grace" period of one month. The JUL issue of the Exciter each year shall have an expiration notice. A full years dues shall be required for renewal of membership at anytime during the fiscal year. New member dues will be pro-rated at $1.00 per month." Also being proposed as a change to the by-laws: "A Board meeting shall require a minimum of 7 board members to be considered a quorum. No proxies shall be accepted for either a quarum or for voting."

Fox Hunting with the NC Highway Patrol

"Max" Bloodworth, KC4UQP
Retired Chief Engineer: NCHP

Fox hunts have always been a source of fun and instruction for Hams, but to those of us in the commercial or public safety end of the business, they sometimes are a matter of life and death. Although the techniques are similar, the equipment used can sometimes be very different, and the area of search much greater. As an illustration, the following is a description of one of the recent "Fox Hunts" by my former employer, the N.C. Highway Patrol Communications Division.

Shortly before Christmas, 1989, a mysterious signal suddenly appeared at several of our receiving sites across the state. This signal appeared to be a dead carrier with a considerable amount of 60 Hz modulation. It did not remain on any one frequency, but seemed to slowly sweep across the entire 40 MHz Police and Local Government band, causing a considerable amount of disruption to emergency traffic. It was reported, at various times, at such far-reaching locations as Fayetteville, Elizabethtown, Salisbury, Newton, Greensboro and Asheville, with enough signal strength to totally wipe out reception of mobile units at the various repeaters and base station sites across the state.

Due to the inconsistent nature of the interference, it was extremely difficult to pinpoint a location, as it seemed to change from minute to minute. A check with South Carolina revealed that they were also receiving considerable interference on their low band (40 MHz) across much of that state. The possibility of malicious interference was immediately considered, since a number of "nuts" feel that they have an axe to grind with law enforcement agencies. An examination of the signal with a spectrum analyzer and service monitor revealed a somewhat distorted 60 Hz sine wave modulation. Since this modulation was phase-locked with the east coast power grid frequency, this immediately ruled out the possibility of satellite or outer space interference, as well as long-distance skip. (This problem occurred during a period of high sunspot activity, so the possibility of skip interference had also been considered). The next logical step was to go after it with a D-F unit. A Doppler Systems, Inc. Direction Finding unit was obtained and deployed to the Newton vicinity, where the signals seemed to be the strongest. This particular unit is the Rolls-Royce of the D-F business, with a combination of digital, voice, and compass rose readouts. However, it was totally confused and frustrated, and gave nothing but totally meaningless readouts, with each successive one being greatly different from the previous check. This once again gave rise to the theory of "overhead" or interference from space ... until a close perusal of the instruction manual (yeah, we know you should always read the manual first, but ... we were in a hurry) revealed that the standard test signal for checking the D-F unit was a 60 Hz sine wave, which causes a random, rotating readout. So much for high tech! This highly advanced Rolls Royce was about as good as a tricycle for the task at hand.

So, like most good commercial communications engineers usually do when faced with an insurmountable problem: we resorted to time proven Ham techniques.

We cobbled together a home-made Doppler Effect direction finder unit, which is excellent for F-M direction finding work. It is simply two antennas mounted about a quarter wave apart, connected to a switching unit consisting of a single NE-555 I-C operating at about 1,000 Hz. and feeding a pair of switching diodes in series with the antennas. This unit connects directly to the antenna input of an F-M receiver, and the audio tone is monitored in the receiver. When the plane of the antennas is broadside to the signal source, a null is heard in the tone. This null is very sharp, and with the proper care in obtaining compass readings, an azimuth of 2 or 3 degrees may be readily determined. The next problem, however, was that the interference did not stay on any one frequency, but slowly drifted across the band. The answer to this was to use an IFR-1000A service monitor to track the frequency drift. Lacking this particular piece of test gear, a scanner receiver could have been used, but not as conveniently.

During the time that all of this searching was going on, it was also noted that the signal disappeared

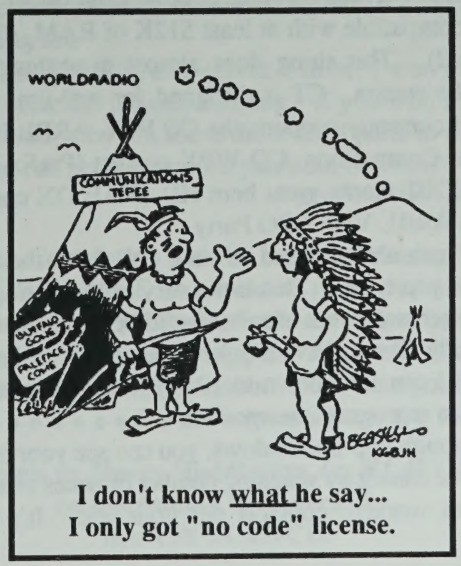
for about 8 to 10 seconds at about 8 to 10 minute intervals. At the time, the significance of this escaped us, but later was to prove very important! After connecting up the home made D-F gear, an azimuth was obtained from the parking lot of the Salisbury NCHP Communications Facility. This azimuth went directly through downtown Charlotte! Oh no! There must be a thousand radio installations on the downtown skyscrapers alone! To confirm this, the D-F vehicle proceeded to Anderson Mountain, near Newton, and another azimuth was obtained: Charlotte again! Just to be on the safe side, a third check was made from the NCHP facility in Shelby; this one likewise pointed to downtown Charlotte, with the intersections of the bearings making a small triangle in downtown Charlotte, with the intersections of the bearings making a small triangle in the heart of the city.

Now it was time to do some localizing! Upon arrival at the intersection of Tryon and Church streets, the signal was so strong that further Doppler tracking was impossible, so a home-made field strength meter was pressed into service. At the bas of the First Union Bank building, the signal was hot enough to burn out the diode in the F-S meter! Since this was Christmas eve, and all of the buildings were closed, the search was discontinued until after the holidays. Christmas aside, all work did not cease! A search of the computerized FCC database for the immediate coordinates of this building revealed two possible culprits: Paging transmitters operating in the 43 MHz range! This immediately pointed out the significance of the timing intervals of the interference! The interference was being generated when the transmitter was supposedly off the air, and disappeared when it was in active use. A monitor was set up at the Salisbury radio shop on 43.22 MHz, which seemed to be the likely suspect.

Sure enough, every time a page was given, the interference disappeared for a few seconds. Just as soon as the buildings were opened following the holiday, a NCHP radio engineer was on the scene, with a building security guard and a maintenance man. There was something like 50 or more two-way installations and transmitters located in a penthouse atop the building, virtually ***none*** with identification. (A ***BIG*** boo-boo, as far as the FCC is concerned.) So, using the intellect that a Patrol radio engineer and long time ham possesses, Al Siler, W4ZPE, felt the tops of each transmitter. When he found one that was somewhat warmer than the others, he checked it out by pulling the power plug. The interference immediately disappeared! Lacking any means of owner identification, he left the unit unplugged and tied a note to the power cord, instructing whoever found it to contact the Highway Patrol before placing it back in service.

Within minutes of his arrival back in Salisbury, he received an extremely irate phone call from the paging service engineer, threatening all sorts of dire action for "... disrupting emergency paging operations." After being told that his oscillating final amplifier had been disrupting police, fire, ambulance, and local government communications for sever weeks in both North and South Carolina, AND pointing out that his equipment was not identified as required by the FCC, he was cordially invited to report the matter to the FCC, with the assurance that the NCHP would be happy to relate their side of the story to the FCC as well. He immediately became quite conciliatory, and co-operated fully in resolving the problem, even going so far as to give the Patrol a number where he could be reached 24 hours a day, should the problem ever recur.

So, while fox hunting is an entertaining an educational pass time, it has it's practical side as well!! (Incidentally, a large number of Highway Patrol Engineers, bother active and retired, are also hams.)



I don't know <u>what</u> he say...
I only got "no code" license.

Computer Aided Contesting

A GREAT WAY TO WORK NEW COUNTRIES AND GET TO DXCC FAST

by Paul Sobon, NO0T

This is the second in a series of articles on tools for DXing.

Here is another great way to work the countries you need for DXCC and other awards - the CONTEST. And here are some tips on some of the tools available to make contesting easy and fun.

I don't know about you, but I hate paperwork, especially that associated with running a contest. You must have dupe sheets, one for each band, then you have to note each new country both in the log and on the dupe sheet.

After the contest you must go through all the logs and dupe sheets looking for dupes (duplicate contacts), then add the whole thing up, type or recopy parts of it so someone can read it, and then mail the whole thing into ARRL or CQ or someone else. Sometimes it hardly seems worth it.

Well, take heart - there is an answer to all this work - it's called contest software. There are many types of software available today. The most popular is called CT - written by K1EA. It will run on an IBM PC or compatible with at least 512K of RAM (640K preferred). This thing does almost everything but work the station. CT is designed for real-time logging. It currently supports the CQ WW, ARRL International Competition, CQ WPX contest (Prefix contest - NO0T works great here HI), WAE DX contest and the ARRL VHF QSO Party.

CT can also be used to send CW from the keyboard as you type it. This is not very useful during the contest generally, but may be useful before or after. I personally like to have my keyer on the side just in case, so I can slow down to 10 WPM or less without having to reprogram the speed in CT.

Through pop-up windows, you can see your progress in the contest by watching number of zones worked, countries worked, contacts per hour, etc. It's like watching one of these video games where you're the pilot. You get a running total of your score all the time and can tell at a glance how you're doing on each band.

There is also a connection to your favorite DX PacketCluster station. With this feature, DX spots coming into your packet station from the cluster are checked against your countries worked list and if you need the country in the spot for a multiplier, it will beep and flash at the bottom of your screen. What more could you want? Well, if you have one of those fancy new rigs with the RS-232 data connection like the Kenwood TS-440S, TS-940S or TS-950S, and ICOM IC-735, IC-751, IC-761, IC-765 and IC-781, with one key stroke, the PC will put your rig on the frequency announced on your screen for the DX spot (i.e. no tuning required). Once you work him, it puts your rig back where you were operating. You can also put out DX spots with three keystrokes and the DX frequency. Note: in the next release of CT, they are planning to have support for the FT1000 from Yaesu.

A new feature in CT is the database MASTER.DAT. K1EA compiled a list of known good calls from several multiop contest logs into a great database. When you key in the call of a station, the program checks the database and offers you his probable country or zone on the screen. If it is the same, you only have to hit enter, otherwise you must type it in. This is just one of many more time saving features available. (You will probably need a couple of meg of expanded memory and an AT-class machine to use MASTER.DAT).

Learning to use CT, the hardest thing that I had to get away from during a contest was trying to write things down. I always had that urge to write the calls I heard onto a piece of paper. After about an hour, I found that I could get used to typing the calls directly to the keyboard. After a few hours, the novelty of the keyboard had worn off and I typed instinctively, unaware of the keys. Calls would come into my headset and onto the screen in front of me as if by magic.

On CW, the F-keys (i.e. F1, F2 etc) control sending pre-programmed CW responses. When you hear someone, type in the call and this program actually sends his call, and the appropriate contest exchange. You can customize what you want the function keys to send. On SSB, if you have a voice keyer, you can activate different voice responses through the

function keys, thus saving wear and tear on your own voice. These voice keyers record your voice responses and store them in memory, so even your friends may think it is really you on the mic.

CT also supports multi-transmitter setups by interconnecting several computers. Each computer keeps a complete copy of the master log which is kept updated via communications lines between the other computers.

At the end of the contest, CT will print out all the logs, dupe sheets, and necessary paperwork to send into ARRL or CQ. No fuss or muss. In addition, a separate standalone program, QSL.EXE, is now provided to provide an automated method of printing QSL labels. It verifies whether you worked a station on different bands, so you only send out one QSL, i.e. ZL9DX receives a QSL for each band the first time you worked him, then never receives another for that band.

K1EA donated CT to the Yankee Clipper Contest Club (YCCC). The registration fee is $40, which will give you the current release and the current version of the manual. It also funds updates and better documentation. I found the documentation to be excellent. Major features considered for the next release are: support for the ARRL Sweepstakes, support for generic contests and country list update from inside the program.

There are several other contest programs available today. Two others that I have had the opportunity to try have been NA, written by K8CC and CQ World Wide written by K4PB. NA is a clone of CT and covers many of the contests that CT does not. It has most of the same features, but at last check, NA did not have a packet interface for PacketCluster or the rig interface for frequency control. (Note: It also does Field Day contest.)

K4PB, Alan Harp, is one of our own local hams who writes contest software for fun. The latest version has many features and also has CW keying from the keyboard. It is written in QuickBasic and he supports several contests including CQ WW, ARRL DX, IARU, and the ARRL and CQ 160 meter contests. He says he is willing to share the software with any ham who is interested (send him a blank disk). He can be reached at home at 919-362-8911.

73 & GUD DX , NO0T

Spare Parts

(or some clever title that doesn't give away the true subject!)

The December 1990 Exciter carried an article by Bill Mills, KC5PF, (via Auto-Call, encouraging hams to provide for the disposition of their amateur equipment in their last bequests. This was to spare non-ham loved ones from wondering how to dismantle the shack.

This made me think of how hams are known for recycling — certainly when one becomes a silent key, but also much before that as one upgrades or becomes tired of equipment (or tired of repairing it!). Used equipment gets sold to someone else who wants it. That may include a new ham, a ham who can fix it or someone who wants the parts. Even when we are ready to finally throw something away, we still salvage the useable parts — especially the rare and sometimes vital to "boat anchors" vacuum tubes.

This salvaging brings me to my point. As hams do not usually throw out what could be good used spare parts, perhaps we should think about recycling our own good used spare parts when we no longer need them. Yes, I mean organ donation. Long ago, I signed that line on my drivers license. But the magnitude of my potential gift hit home when I met a woman (mid-thirties in age — MY age!) who has lived several years because she received a good used heart-lung set.

In the Afterlife, as I expect it to be, I won't need what's been left behind decaying. If you won't need yours either, why not leave those used parts to someone who can get a few more years out of them!

Peggy Fisher Price N4SSS

[Ed. Comment: Thanks Peggy, for using your *RARS CHALLENGE* to remind us of the opportunity for that ultimate "Public Service" -- what can be more important than that of giving life? Another challenge to RARS members: I'm a donor. How 'bout you??]

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The Trials & Tribulations of a New Ham

With Help From: Sir Edmund Hillary, Archimedes, the Mt. Olive Pickle Company, N4RGG, N4UOF, and N4BYO?!

In the beginning (of 1990) I attended the RARS Novice / Tech class. After passing the appropriate tests, I started planning what equipment I would operate when my license finally arrived.

My plans were to get involved in 2 meters for handling formal traffic. (I had spent much time listening to PCTN before even trying for my license.) I also wanted to be able to help in emergencies where ever they may be. It seemed my best bet to purchase an HT and antennas for the various operating conditions. (You must understand that I live in an apartment which does not allow outside antennas and my budget is a typical ham budget: I could afford much less than I had plans for.)

I purchased a 2 meter HT and a 5/8 wave Larsen mag-mount antenna for the car. I still couldn't transmit (license hadn't arrived yet) so I couldn't tell if I could hit any repeaters from the apartment with the rubber duck. The "S meter" on the HT seemed to indicate that I should find a better antenna for indoors use. Along came a note on the RARS BBS that N4RGG was selling a 5/8 wave mag-mount antenna and a 2 meter amp. We met in the shadows of Tower Shopping Center and made our trade. My dollars for his antenna & amp. I put this antenna on a large cookie sheet (a trick picked up from N4UOF in the RARS class), and looked for a place to put the contraption in our 2nd floor bedroom.

It seemed hopeless, the apartment is small and I did not have a place that either my wife or I could sacrifice to put the large cookie sheet. Then I found the access door in our closed which opened into the attic. Cookie sheet and antenna fit nicely in the attic, and the "S meter" showed things were much better. When my license finally arrived, this set up took care of the PCTN operation from home; it was now time to do something for emergency portable operation.

The ARRL antenna handbook to the rescue ... my ability to innovate was a help here too. The first project was a replacement for the rubber duck. After some playing with the design, I ended up with my version of the "famous PICKLE antenna" that N4BYO held up at a RARS meeting a few months ago. The performance was astonishing for it's size. The simple fact was this 6" antenna had the receive gain of the 5/8 wave in the attic, and the transmit gain was close. The problem with the antenna was it's slight directionality and slight frailty (primarily due to my innovative construction technique).

The pickle antenna was fun, and I keep it as a conversation piece. My real desire was to have an antenna that I could take to a remote site and operate in emergency situations. I settled for two designs for a 2 meter cubical quad. Combining the two designs, I ended up with a 4 element portable, quad. (note also that in this apartment I have no place to build ... except, of course, the dining room table.) After discussing the prospect of using the dining table, I made the quad from scrap lumber and some aluminum ground wire. (Table and chairs are a bit tall for a saw horse ... but, they work.) I took the handle off a mop (makes for a real short mop, but the XYL didn't catch on for 2 whole days), and used it as a mast, and mounted the antenna to it. Then off to my local R/S store to purchase a 5' antenna pole and roof mount tripod. Put the pole in the tripod, and the mop handle in the pole. Now, to find a spot in the bedroom ...

As I said already, it's a small bedroom. This thing lived a few days, and showed very good front to side rejection, however, the front to back left a bit to be desired. The VSWR was great, much greater than I thought I should be. Out came the saw again (this time in the bedroom — the XYL had already finished cleaning up the last remnants of my mess in the dining room ...) and off came the front director. I remounted to the mop handle, and now the quad fit much better in the room. Even being under the 5/8 wave in the attic, it did a great job, and the VSWR was not too bad. It probably would have stayed and kept working well except I made one terrible error which changed ALL my plans. My wife got her license!

Now many plans had to change, not the least of which was to provide more than one antenna so we could operate at the same time of the same or different repeaters (she got an HT also). Lots of mobile and

"base" antennas later (another story for another time) I ended up with the quad even more portable (taken apart) and the tripod sitting near the wall and N4RGG's 5/8 wave mag-mount left over.

I put the mag-mount on the tripod, just "because it was there." (That is how Sir Edmund figures in.) About a day later I decided to check the VSWR increase, just in case I ever desired to use this contraption ... EUREKA!!! (Archimedes, in case you didn't catch that one either.) The VSWR was very low and the operation was great. Here's why: a 5/8 wave antenna should have a ground plane extending at least 1/2 wave from the center. Gee ... this tripod has three foot long legs!!! That's real close to 1/2 wave on 2 meters (all of that college math wasn't wasted on me!).

Now the moral of the story (any story with a Greek ***must*** have a moral): People who have a need for a good antenna indoors, and do not wish to take a table top for a cookie sheet, should put a roof mount tripod (decorated if desired) in a corner or along a wall, and stick a 5/8 wave mag-mount on top ... OR ... if your corner is too small for an exercise machine with big rubber bands, or even too small for a TV, you can install this antenna and have fun working a ham band. (OK, so it's not Peabody and Sherman, but they're out on video now, and you can move to a ***different*** corner to watch them.) (OH, yes, I hope you figured out where Mt. Olive Pickle figured into the story. The pickle antenna is another story ... perhaps another time. NO NEED TO WORRY AB4EL, I won't be any competition for your column!!!

73 de N4YRD
John Jaskolka

VHF/UHF & 2-METER SIG REPORT

We held our March meeting on the 14th at the QTH of Ronnie and Sherry Reams. The following hams were present: WA4PEN, KC4UVQ, KB4EXL, KA2FWC, WA4LHE, KA3PSK, KN4AQ, KB4MDZ, WD4MYM, WA4MJF, and KB4VYP.

Gary, KN4AQ, informed the group that amateur radio auto license plates are at risk of going up to $10 per year, like the vanity plates. He said that rural amateurs need to call their representatives and let their opinion be known.

Ed, WA4PEN, called the meeting to order and made a few announcements about upcoming club events. Glenn, WA4LHE, gave a brief treasurer's report.

Ed told the group that the issue of increasing RARS dues to $12 per year will be brought up at the April meeting. He also reminded everyone that we need to begin preparation for the upcoming VHF/UHF QSO party. It would be GREAT if we could obtain the use of portable crank-up towers. Ed asked for help with the Friday night Traders Net and Rick, KA3PSK, said he would help as soon as he got a transceiver.

Repeater status is unchanged from last month except that W4DW has a new multiplier board that was put in by Frank, KA2FWC, and Chuck, KB4MDZ. The original board is being reconditioned.

Some discussion was held on various topics including alternate tower sites, voting receivers, control lines, abandoned feedlines and 460 Mhz antennas, and repeater noises.

Chuck gave an excellent explanation on the internal operation of a typical VHF/UHF frequency synthesizer.

The program at the April VHF/UHF SIG meeting will be on the features, advantages, shortcomings, and cost of typical new and used VHF/UHF radio equipment. This meeting will be an excellent opportunity for anyone considering the purchase of such equipment at the up-coming RARS Hamfest because the meeting will be on April 11th and the hamfest is on the 14th. The program will be given by Gary, KN4AQ, and/or Chuck, KB4MDZ.

The meeting ended and we headed for the kitchen for some pie and cake prepared by Sherry, KB4EXL.

Glenn Clary, WA4LHE SIG Secretary/Treasurer

Interference Problems?

Write to the Federal Communications Commission, 31 Hopkins Plaza, Room 1017, Baltimore, MD 21201, Attn: Joycelyn Walls, and ask for a set of their 6 "Monitors" (a bulletin covering a different aspect of interference). There is no charge. We're told they're all exceptionally well written! *Tnx K4LMB & AUTO-CALL*

Grounding

by Joe White, WA4GIR
Part II

Connection to the Earth

"Okay, Okay, Alright already. I need to connect my rig to the soil around my house but some people say it sufficient to drive a pipe in the ground, others suggest that I need to bury a $100 dollars of copper wire at the base of the antenna, and still others recommend connection to a large buried metal object (Detroit products are frequently suggested for this). What's the deal?" Well the simple answer to your question is "it depends". The actual ground connection that is appropriate depends on whether you are attempting to provide a low-loss ground plane for use with a vertical antenna or whether you want a ground for lightning protection. (I'm assuming that any grounding provisions for safety are already taken care of by the installation of grounds by the power utility and the electricians that wired the house. The installation of that ground is not discussed here. It's requirements are covered in the National Electrical Code.)

If you are trying to improve the efficiency of a vertical antenna mounted near ground level, then you want to provide a low loss path where the currents are likely to flow — on the ground surface near the base of the antenna. For this application you can't install too many radials. Just rent a gas powered lawn edger (with a couple of extra blades), cut groves outward from the antenna base and run copper wire in each one. The more radials the better, and the longer the better. They should be as long as the antenna to reduce the losses close in to the antenna and to keep the angle of radiation low, thus improving the distance between skips. Be wary of the vertical antenna brochure that says it sufficient to place your vertical antenna directly on a ground rod without radials because this the submerged ground does little for reducing radiation losses. (Note that the ground plane formed by these wires serves a different function from the four radials drooping from the CB ground plane antenna. Those quarter wave elements terminate the coax and contribute little to the radiation pattern).

Grounds for lightning protection don't need to be on top of the ground. In fact, having the ground electrode buried deeply where the soil stays moist provides a better connection to the mass of the earth. One or more ground rods driven into the earth and bonded together may suffice, but connection to a large metallic buried structure is better. A copper water pipe is one good example as long as water meters or other insulating breaks in the pipe are bypassed with jumpers wires. Chemicals are sometimes used around ground rods to improve the soil conductivity in the vicinity of the ground electrode, but many of these are counter-productive since they induce corrosion on the surface of the grounding electrode that insulates it from the ground.

The current into a ground system caused by a direct lightning strike may be as high as 30,000 A. If the ground system consists of a single ground rod, this current will spread out radially, resulting in a large current density (the current per unit area flowing in the earth) with the current density getting lower and lower as the point of measurement is moved further from the ground rod. This is because the current spreads out as it leaves the area of the ground rod. This current flowing radially outward from the ground rod through the earth introduces a voltage drop between points along the current path. If you were to measure the voltage between two points along any line, you would find, during a strike, that near the ground rod, a large, potentially-lethal voltage would exist between two points on the line separated by a foot or two when they are close to the rod. Since, a person can stand on the earth with their feet separated by this distance, we call the voltage difference a "step potential". Consequently, a person walking in the area could be electrocuted if one foot were a foot or two closer to the ground rod than the other. (Cows are more susceptible to this since their feet are further apart.) The possibility of hazardous step potentials is reduced by using a ground network such as a buried mesh or a radial system as discussed for vertical antennas that distributes the current over a large area. The mesh maintains a constant potential (or voltage) over the entire area of the mesh — even though that voltage might rise somewhat above that of the earth at a distance from the strike. Therefore, the step potential would be minimal over this area. The step poten-

tials at the edges of the mesh would also be much smaller than those around a single rod because of the spreading out of the current through a relatively low resistance grounding network. These networks are used to reduce the risk in areas that are likely to be occupied when a lightning strike is possible. However, ground network or none, during lightning storms, stay away from ground rods that might carry lightning currents.

The question of tying a lightning ground to the power ground if often debated since tying them together can cause the lightning currents to flow through the electrical grounds. Since the lightning currents have very fast risetime, large voltage drops may result in the ground wiring because of the inductance of the wire — even if low- resistance wiring is used. However, if the antenna lightning ground is not tied to the safety ground in some way, large differential voltages may be introduced between the antenna ground and the electrical ground, catching the ham station in the middle, possibly frying it. The chances of this are reduced are minimized if the lightning ground and the electrical ground are bonded together at the points where they both enter the earth. This keeps the two grounds closer to the same potential during a strike, minimizing the chance of damage. The safe approach is to disconnect the rig from the antenna whenever it is not used to prevent lightning damage.

For More Information....

As I said at the beginning, this isn't a complete reference on the subject of grounding. I didn't talk about grounding on sailboats or how to establish a ground in the artic (remember ice is an insulator). I did try to mention some of the considerations for grounding in the typical amateur installation to try to provide some insight on what kind of ground is necessary for each purpose of grounding without going into detail on how the grounds are actually constructed. The following books and magazine articles are recommended for more complete data on grounding of typical amateurs stations.

Rolf Anderson (K8SL), **Grounding of Ham Equipment**, The RARS Exciter, April 1989, and, Rolf Anderson (K8SL), Ham-Radio Grounding, The RARS Exciter, May 1989 The first article in this two-part series describes reasons for grounding, and ground systems for towers. The second article describes grounding techniques for the reduction of electromagnetic interference (EMI) and describes the use of a table-top ground plane to provide a low-impedance ground connection for all of the station equipment.

Richard Little (KY9L), **Protect Your Amateur Station from Lightning**, Ham Radio, September 1989. This article describes the grouping of equipment grounds, bonding together of station grounds, power grounds, water pipes, telephone and cable TV ground connections to minimize damage from lightning hits — both damage that is obvious immediately and hidden damage that usually shows up later as reduced reliability of the equipment.

Peter J. Bertini (K1ZJH), **Common-Point Grounding Lightning Protection for Repeaters**, Ham Radio, July 1989. K1ZJH describes the use of a copper sheet to establish a single ground point to minimize damage that can be induced by lightning currents that induce damaging voltage differences between grounds in a repeater installation.

Capt. Paul H. Lee (K6TS), The Amateur Radio Vertical Antenna Handbook, Cowan Publishing Company, New York, 1974. Richard C. Johnson and Henry Jasic, The Antenna Engineering Handbook, McGraw Hill, New York, 1984. These books, and any others that describe vertical antennas, discuss the importance of grounds composed of radials networks lying on the surface or buried just below the surface of the ground.

ARRL Radio Amateur's Handbook, The Handbook describes a composite station ground system that uses a copper pipe section to act as a common point ground and quarter-wavelength radials tied to it to improve its performance as a ground at selected frequencies.

National Electrical Code, National Fire Protection Association, Quincy Ma. Conformance to the Code (or NEC as it is sometimes called) is required by most local governments for buildings constructed within their jurisdiction. The Code specifies ground conductor sizes, grounding electrodes (ground rods or whatever else you use to tie to the earth), connection between grounds and between the neutral conductor in your electrical service and grounds. This document specifies requirements — it does not contain background information explaining the rational behind the wiring rules it contains. It also is not the most easily

read document as evident by the number of handbooks that have been written attempting to explain its application (including one that is written by the same group that publishes the handbook itself). Personal note: if you don't think it can be hard to find things in the NEC, then, for your first encounter with it, you should try to figure out if you can install a welder in your basement, and if so, what do you need to do it.

National Electrical Safety Code, Institute of Electrical and Electronics Engineers, New York, NY. (also designated as ANSI C2) Although this document resembles the NEC in name, it addresses requirements of communications and power facilities. Like the NEC, it also describes ground sizes, grounding electrodes, and ground configurations for multiple ground systems, but it is not the code that your house wiring must meet.

Henry Ott, **Noise Reduction Techniques in Electronic Systems**, Second Edition, John Wiley and Sons, 1988, and Ralph Morrison, Grounding and Shielding Techniques in Instrumentation, Third Edition, John Wiley and Sons, 1986 These two books are the classic references for reduction of electrical noise in electronic equipment. In addition to shielding considerations and wiring placement, these texts discuss grounding techniques for elimination of ground loops, and grounding of shields for maximum effectiveness. Not much is covered about safety grounds although they do cover how to hook up grounds for noise reduction in such a way that both the safety grounds are not compromised.

"No Time For Such Things"

A RARS Challenge Gone Sour

an Editorial by AA4MY

In response to his ***RARS Challenge***, N4OIC told me & the world (via the 04/64 repeater, 3/6/91 @ approx 8:10 AM) he was very annoyed that I did not ***seek his permission*** prior to including his call in the RARS EXCITER. At first, I thought he was putting me on. But he was dead serious. When asked if he would provide some info for the Challenge, he said he "... had no time for such things..." — but mainly, he felt that I had no ***right*** to include his name in the Challenge without asking permission first.

Sorry you feel that way, — cuz certainly, the Challenge was not meant to irk the membership. The challenge is MY ***appeal for help*** in getting some new information and/or ideas in the EXCITER. You may think otherwise, but I feel any name appearing on our RARS Roster is "fair game" when a fellow club member is in need of help -- especially when working on a club project. Correct me if I'm wrong, but I thought that was the whole idea for belonging to a club. We help each other.

No time for such things? You're certainly entitled to feel that way, but I sure am glad the club as a whole doesn't share those feelings. What kind of club would RARS be if N4BYO "didn't have the time" (Jim is involved just about nightly in club activities, or else working "behind the scenes" trying to improve the club for us all). What kind of activities would there be if 'Nita & N4IQA & NA4G, & AB4DQ "didn't have the time." How long would the RARS repeaters last without the efforts of KB4MDZ, AB4OZ & WA4PEN? The list goes on and on. Each and every one of us is a member — and just like you, we ALL pay our $10 dues. But what would the club be like if everyone JUST paid their $10 and did no more?? I don't think there would be a RARS. I certainly wouldn't want to be part of it.

Without trying to be self aggrandizing, I figure I put 20+ hours a month — every month — into the Exciter. Much more time is required if I get no input from the members. The challenge asked only for a little info -- about anything at all. Don't even have to write -- just a phone call. Is that too much to ask??

When I started the challenge, I didn't expect that every one would respond. Quite frankly, I was pleasantly surprised by the ***great*** responses ***we all have enjoyed*** reading.

"Can't find the time?" I guess I just expected a little more from him when asking for help.

I'm changing the status of N4OIC's Challenge from "Still Waiting" to "Received." And I want to thank him for giving me the motivation and a topic to write about -- that was the whole idea behind the ***Challenge*** anyway.

Vince, AA4MY

MAKING ANTENNAS PLAY

by Steve Modena, AB4EL

An 80 Meter/WARC Bands Vertical Antenna

This is one antenna that started out as one thing and turned into another, twice over. I just don't have room for an 80 meter dipole, since my antennas are now restricted to occupying a 30 foot diameter grove of tall pine trees. I put up a 80 meter 1/4-wave vertical to replace using my mobile to talk to K1ANX in Massachusetts every Sunday on 3.784 MHz.

Figure 1 shows the antenna. It is a 66 foot piece of #12 stranded, tinned, insulated wire hung from a pine tree. At the base is a female coaxial connector, with the center soldered to the vertical wire. There are 6 radials of #22 stranded, insulated wire, each 32 feet long. I use plastic tent pegs to stretch the radials out just off the ground.

Why are the radials 32 feet and not 66 feet? Recently I saw a microfiche of a government document on improvements to the NEC antenna modeling program (pappy to MININEC and ELNEC and others). In a graph, the author claimed that if a 1/4-wave vertical had 100 radials, antenna gain would rise steadily the longer the radials were made. OK, that's standard. But, for 5 radials or 20 radials, gain increased (same as for 100 radials) up to about 0.2 wavelengths. Then as the radials got longer, antenna gain plummeted! Wow, that's something new, if true!

I actually started out with the vertical wire being 72 feet, to be on the safe side. With my noise bridge, I found resonance to be 3.449 MHz at 75 ohms resistive. On a lark, I checked for resonances at higher frequencies. They were 9.586 MHz, 16.980 MHz and 23.199 MHz. If I hadn't yet worked any of the WARC bands, I would have missed the significance of this set of frequencies.

Trimming the vertical wire to (finally) 66.0 feet, resonances were: 3.778 MHz (60 ohms), 10.768 MHz (110 ohms), 18.199 MHz (110 ohms) and 25.183 MHz (115 ohms). For your information the WARC bands are: 10.100 to 10.150 MHz (30 meters), 18.068 to 18.168 MHz (17 meters) and 24.890 to 24.990 MHz (12 meters). Though not exactly "in band," all are within easy tune up.

I connected some coax between the antenna and my trusty MFJ EconoTuner. Low SWR could be achieved on each band in a broad tuning manner, indicating that the antenna was an easy match on each band. I made immediate connects on each band with reasonable to excellent signal reports.

Tuning up on 40, 20 or 15 is difficult, with the SWR jumping around erratically. This is because the 66 feet wire acts an end fed multiple of a 1/2 wave (high impedance input equals difficult to match). 10 meters was touchy, but OK. Tune up on 80, 30, 17 and 12 is easy because the antenna is "center fed" (against ground) in 1/4, 3/4, 5/4 and 7/4 wave modes, respectively.

When I made the Sunday evening sked with K1ANX (a club member who likes to read the Exciter), he accused me of using an amplifier or putting up a long wire. Anyway, he knew I wasn't running mobile. What more can you ask?

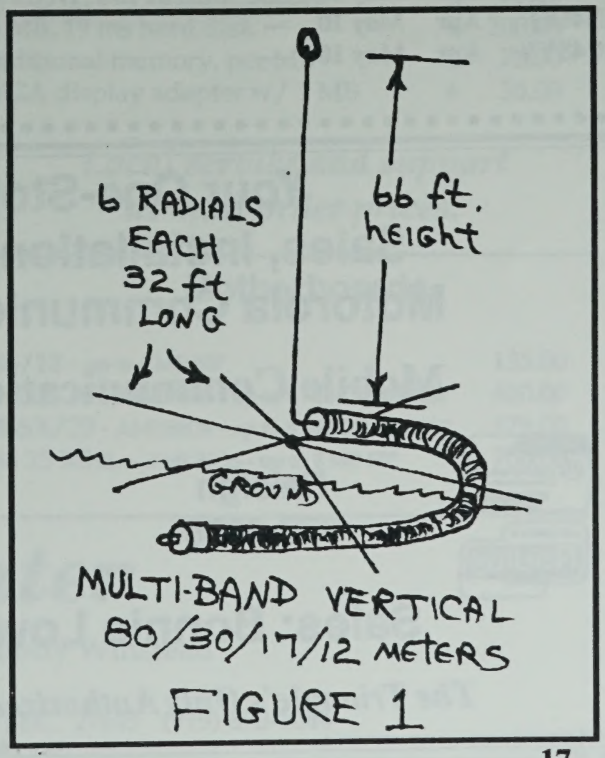

FIGURE 1

The RARS Challenge

As described in the December EXCITER, yer humble Editor is seeking new material / ideas for the newsletter. Each month we will extend the challenge to 5 or so members, selected at random, who are requested to supply some info to the Editor. While a 2 page feature article would be nice, I'll settle for any information you'd care to share with the club. What u do for a living, what your interests in amateur radio are(or other interests, as well); what you like about RARS, what you'd like to see changed. Anything at all. Input can be typed, hand written, or even a telephone call! Come 'on folks, we're not asking for "War & Peace," just a little info!!

The RARS Challenge Stats:

Call	Extended/Due Date		Status
N4YRJ	**Apr**	**May 10**	**---**
N4UOC	**Apr**	**May 10**	**---**
WA2SRZ	**Apr**	**May 10**	**---**
KN4OQ	**Apr**	**May 10**	**---**
KC4SYV	**Apr**	**May 10**	**---**

THE PINE BOX

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Cushcraft ATB-34 4 ele Tribander beam in good condition for 10-15-20 meters. Includes 1:1 balun and new hardware. Power handling capability 2000 watts PEP. Wind Surface 5.4 SQ FT, weight 42 pounds. Excellent forward gain and F/B ratio. Price $125.

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Latest Calls Issued:

As of Feb 1st: AC4CL, KN4VS, & KC4VVN.

Tnx: K4HF

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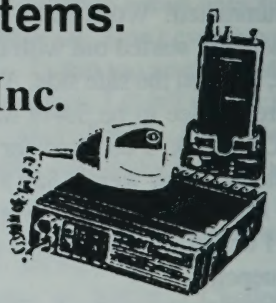

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2400 bd. external modem	100.00
FAX/Modem - intnl. 2400 bd. (Send/Receive - 9600 bd. grp. III)	160.00
45 MB, 28 ms Seagate IDE hd	250.00
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Dual HD/FD IDE controller (with 1 parallel & 2 serial ports)	45.00
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Mini desktop or tower case (with 200 watt power supply)	135.00
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286/12 - up to 4 MB SIP	135.00
386SX/16 - AMI BIOS - up to 8 MB DRAM/SIP	400.00
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Next Regular RARS Meeting: Wednesday, April 3, 7:30 PM
Raleigh YMCA , 1601 Hillsborough St.
RARS Nets: Daily @ 8:00 PM on 146.04/64
10 Meter - Tuesdays, 7:00 PM on 28.364 MHz
YL Info Net - Wednesdays, 9:30 PM, 04/64
RARS Trader's Net - Fridays, 9:00 PM, 04/64
Technical Information Net - Saturdays, 8:30 PM, 04/64
RARS Computer Bulletin Board: 781-2530

Events Calendar

Apr	03	Regular RARS Meeting, 7:30 PM, YMCA
Apr	10	RARS Homebrew SIG, 7:30 PM, Info: KM4BU @ 481-3856
Apr	11	RARS VHF/UHF/2 meter SIG, 7:30 PM, Info: WA4MJF @ 266-4434
Apr	**13**	**RARSfest Hospitality: 7:00 PM All Members Welcome!!**
Apr	**14**	**RARSfest!! Be there!**
Apr	16	RARS HF SIG, 7:30 PM, Info: N4UOF @ 469-1758
Apr	17	Swan Island DX meeting. See Inside.
Apr	17	RARS Advisory Board Meeting, 7:00 PM, YMCA. All members welcome!
May	**25**	**Hamfest Durham!!** w/ Exams (exam info: Pete, KY4Y @ 544-3215)
Jun	05	Regular RARS Meeting w/ Exams (exam info: Vince, AA4MY @ 847-8512)